TWO NEW SPECIES OF TUBULARIAN HYDROIDS FROM SOUTHERN AUSTRALIA

By Jeanette E. Watson

Honorary Associate, Invertebrate Zoology, Museum of Victoria, Russell Street, Melbourne 3000 Australia

Abstract

Two new species of tubularian hydroids from southern Australia are described. *Hybocodon cyrptus* is the fourth recorded species of this rare genus, and a first record of the genus from Australia. *Ralpharia coccinea* is the second species of a genus known only from Australia. Notes are given on the ecology of both species and on the reproduction of *R. coccinea*.

Introduction

The new species of tubularian hydroids described in this paper occur in ocean waters and in two embayments of the southern Australian coastline. One is a second species of the formerly monospecific genus *Ralpharia* Watson, 1980: the other belongs to the rare genus *Hybocodon* L. Agassiz, 1862, not previously recorded from Australia.

Ralpharia magnifica Watson, 1980, known only from Australia, was described from shallow water reefs of Western Port, Victoria, growing on an alcyonacean host. A second species, described here, has since been found in Western Port growing on the same species of alcyonacean host as *R. magnifica*, and sometimes in association with it. *Hybocodon* comprises three known species, *H. prolifer* Agassiz, 1862, known from the North and South Atlantic and Pacific Oceans (Russell, 1953), and from New Zealand (Ralph, 1953); *H. unicus* Browne, 1902, recorded from the South Atlantic, Indian and South Africa (Millard, 1975); and *H. chilensis* Hartlaub, 1905, from the Atlantic coast of South America. The first two species of *Hybocodon* are better known from their medusae than from the hydroid stage; *H. chilensis* has been recorded only once, as the hydroid.

Type material of the two new species is lodged in the National Museum of Victoria, Melbourne.

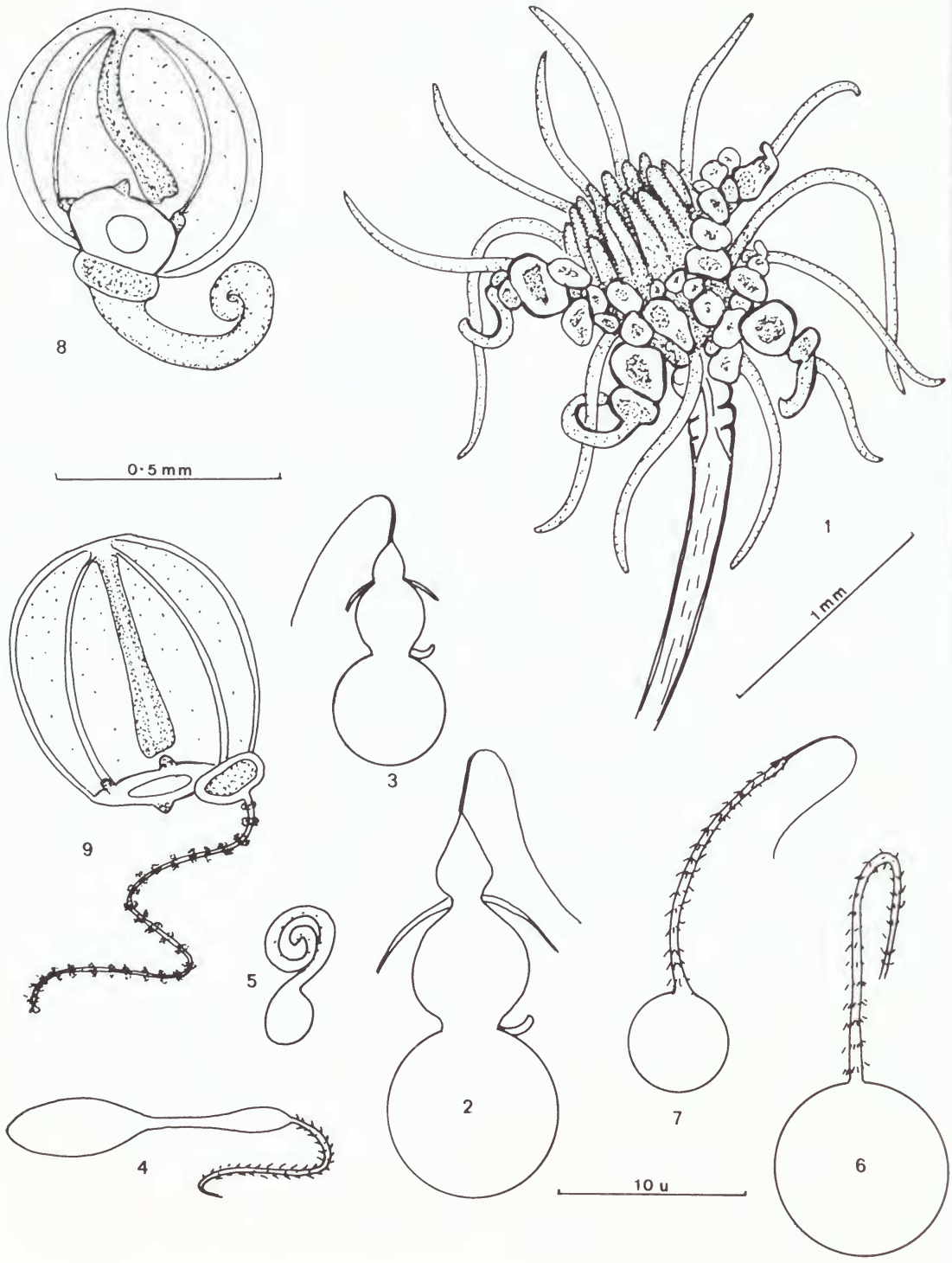
SYSTEMATIC SECTION

Hybocodon Agassiz, 1862

Hybocodon cryptus sp.nov.

Type material: holotype colony. NMVG2601, Coll: J.E. Watson, from reef, 3 km off Portsea, Port Phillip Bay, 15 m deep, 14.7.82. Part of colony preserved in 70% alcohol and part in 5% formalin.

Description from holotype colony: Hydrocauli up to 3 cm high and 0.5 mm diameter below hydranth. Stems solitary, unbranched, erect, sometimes obscurely undulated, narrow proximally, increasing in diameter distally to hydranth. Perisarc firm, thick, transparent, shining, with numerous fine annular growth striae externally, and indistinct internal longitudinal canals, becoming thin, swollen and loosely wrinkled below hydranth. Hydranth terminal, 2 mm long and 6 mm across the extended aboral tentacles (living material). Aboral tentacles 12-18 in number, 2.5 mm long, slender, fragile, with pointed tips. Oral tentacles stubby, 18-30 in two closely set rows surrounding a conical hypostome. Blastostyles erect, branched, 6-8 arising just above aboral tentacles, with several to many clusters of medusa buds in various stages of development. Medusae at liberation almost spherical, about 0.5 mm diameter, with a single tentacle arising from a large bean-shaped marginal bulb; three small triangular marginal bulbs at the bases of the other radial canals. Margin of bell very slightly oblique, velum a wide shelf with a small circular opening. Hypostome long, cylindrical, extending almost to margin, slightly swollen distally, marginal tentacle thick and contracted prior to, and immediately after liberation; at 24 hours after release extending to more than 1 mm, with 15-20 batteries of nematocyts. Nematocysts also scattered over exumbrella surface, more numerous towards top of bell.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Nematocysts of five kinds present in hydranth:

Stenoteles of two sizes in aboral tentacles: (i) small, capsule slightly elongate, 6-7 μ wide, butt 6-7 μ long, very abundant; (ii) capsule spherical, 9-10 μ diameter, butt 11-12 μ long, thread fairly short, abundant.

(iii) Microbasic euryteles, capsule 8 μ long, 3-4 μ wide, butt 8-9 μ long, with long thread, common near tips of aboral tentacles.

(iv) Desmonemes, capsule 3-4 μ long, 2.5-3 μ wide, thread remains loosely coiled on discharge; common in tentacles and body of hydranth.

(v) Heterotrichous anisorhizas, capsule spherical, 8-11 μ diameter, thread very long, thick and heavily barbed, rare in proximal parts of tentacles.

Nematocysts of four kinds present in medusa:

Stenoteles, microbasic euryteles and desmonemes similar to nematocysts (i), (iii) and (iv) of hydranth.

(vi) Microbasic mastigophores, capsule 5-6 μ diameter, butt 13-18 μ long, with very long thread.

Colour: Stems greenish yellow, aboral tentacles transparent, oral tentacles white, body of immature hydranth rose pink, becoming pale yellow with longitudinal stripes at maturity, gonophores pale yellow. Newly liberated medusa transparent, tentacular marginal bulb creamy yellow, other marginal bulbs golden.

Remarks: The hydranth and medusa of *Hybocodon cryptus* are similar to those of *H. unicus*; however *H. cryptus* may be distinguished from that species by the cnidome of the hydroid. The scattered nematocysts on the exumbrella of the medusa of *H. cryptus* clearly distinguish the species from *H. prolifer*. The cnidome of *H. chilensis* is unknown. It is, however, a larger species measuring 6 mm across the tentacles (Hartlaub, 1905), and is known only from the type.

H. cryptus is a common winter hydroid in southern Port Phillip Bay and in the oceanic waters of Bass Strait, growing and reproducing at lowest water temperatures of 10°-12°. It usually grows in sparse clusters of up to 15 well separated stems, growing to 8 cm high from a hydrorhiza deeply embedded in sponge; it occasionally also occurs on old shells. Although sometines growing in open situations, it is a cryptic species whose preferred habitat is in crevices sheltered from strong water movement. The hydranths are readily shed and the stems show evidence of repeated regeneration, possibly due to fish grazing.

Figures 1-9. *Hybocodon cryptus* sp.nov.

Figure 1. Fertile hydranth, drawn from living holotype colony.

Figures 2-6. Nematocysts from hydranth, all drawn to same scale.

Figures 2, 3. Stenoteles. Figure 4. Microbasic eurytele. Figure 5. Desmoneme. Figure 6. Heterotrichous anisorhiza. Figure 7. Microbasic mastigophore from medusa (same scale).

Figure 8. Newly liberated medusa. Figure 9. Spent medusa 24 hours after liberation.

Ralpharia Watson, 1980

Ralpharia coccinea sp. nov.

Type material: holotype colony (male colony), NMVG2602, Coll: J.E. Watson 12.9.82 from reef, Crawfish Rock, Western Port, Victoria, 3 m deep, on the alcyonacean *Parerythropodium membranaceum* Kükenthal. Part of colony preserved in 70% alcohol and part in 5% formalin.

Description from holotype colony: Hydrorhiza tubular, 0.3-0.5 mm diameter, embedded in the alcyonacean substrate. Stems short, robust, to 20 mm long, widening to 0.5-0.8 mm diameter below hydranth. Perisarc thickest proximally, with faint annular striations, thinning distally, becoming a loosely wrinkled sheath below hydranth, coenosarc longitudinally striated. Hydranths variable in size, distinctly separated from stem by a platform-like base. Mature hydranth 5-7 mm across the extended tentacles (living material), aboral tentacles 2 mm long, 20-24 in a single verticil, and 20-24 short oral tentacles in a tuft 2 or 3 deep surrounding an elongate hypostome. Gonophores arising from a wide shelf between the hydranth body and aboral tentacles, 8-10 borne singly on short, un-

branched blastostyles, balloon-shaped, distally truncated, up to 1.5 mm long at maturity, with 4 conspicuous radial canals and circular canal and 4 rudimentary tentacle knobs; without mouth or tentacles at liberation.

Nematocysts of five kinds present on hydranth and gonosphores:

Stenoteles of two sizes: (i) large, capsule spherical, 10-11 μ diameter, common on hydranth body and aboral tentacles, butt 10-12 μ long; (ii) smaller stenoteles, capsule spherical, 5-6 μ diameter, butt 5-6 μ long, very abundant in tentacles and on gonophores.

(iii) Macrobasic mastigophores, capsule subglobose, 12-13 μ long, 8-9 μ wide, thread very long, thick, of same diameter and spinose throughout, spines longer and thicker, near base. Very abundant at base of aboral tentacles and on hydranth body.

(iv) Desmonemes, capsule bean-shaped, 5 μ long, 3 μ wide.

(v) ?Atrichous isorhizas, capsule flask-shaped, 10-12 μ long, 4-5 μ wide, with a short cylindrical neck. When discharged, neck everts into a short thick thread. Moderately common in oral tentacles.

Colour: Stems pale green to brown, coenosarc orange in distal region, tentacles transparent, sometimes with a faint orange longitudinal stripe; hydranths and gonophores brilliant scarlet, radial canals of immature gonophore of a glistening frosted white appearance. Umbrella of liberated medusa clear, radial canals purplish, spadix orange.

Remarks: Ralpharia coccinea is easily recognised by its small size and robust, brilliantly coloured hydranths and gonophores. The extreme difference in size, and certain differences in the cnidome distinguishes this species from its congener, *R. magnifica*. the unusual flask-shaped nematocysts of the hydranth could not be easily discharged, even in living material, and hence these are only provisionally identified as anisorhizas.

A small female colony (not included in the type material) also collected from Crawfish Rock by the author (17.12.78) contained mature gonophores identical in shape to the male and containing about 12 clearly visible ova. Prior to liberation, the gonophores of both sexes pulse spasmodically and the radial canals change from white to a purplish colour. One or two amoeboid processes may protrude from the opening of the female medusa. Release of gonophores occurred at night in the laboratory. The spent female medusae are similar to the male and continue spasmodic pulsing movements for about 12 hours after release. The orange coloured actinulae emerge with 5-7 rudimentary tentacles, and if remaining on the alcyonacean substrate, crawl sluggishly away before settling. The subsequent history of the actinulae was not followed. However, the early stages are so similar to those of *R. magnifica* that there is little doubt that the metamorphosis of *R. coccinea* will follow the same sequence as described for *R. magnifica* (Watson, 1980).

Of considerable ecological interest is the obligate association of the two closely related species with the same alcyonacean substrate. *R. magnifica* grows from the alcyonacean in sparse colonies of up to 20 stems while *R. coccinea* may form colonies of up to 200 hydranths growing close to the alcyonacean surface. The hydrorhizas of the two species are often intergrown through the thin, sheet like alcyonacean. The growth and reproductive seasons of the two species overlap only slightly: *R. magnifica* is a summer hydroid, reproducing at maximum water temperature, whereas *R. coccinea* grows,

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Figures 10-18. *Ralpharia coccinea* sp. nov.

Figure 10. Fertile hydranth, drawn from underwater photograph *in situ* of living specimen from holotype colony.

Figure 11. Developing female gonophore showing amoeboid processes protruding from medusa prior to liberation.

Figure 12. Spent medusa, 8 hours after liberation.

Figures 13-18. Nematocysts, all drawn to same scale. Figure 13. Large stenotele from hydranth. Figure 14. Smaller stenotele from hydranth and gonophore. Figure 15. Macrobasic mastigophore from hydranth. Figure 16. Desmoneme from hydranth. Figure 17. ?Atrichous isorhiza from hydranth, undischarged. Figure 18. Same, discharged.

and is reproductive in the rising temperatures of late winter to spring.

Acknowledgements

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SEROLIS (CRUSTACEA, ISOPODA, SEROLIDAE) FROM AUSTRALIA, WITH A NEW SPECIES FROM VICTORIA

By K. Harrison* and Gary C. B. Poore†

* Department of Zoology, University of Nottingham, Nottingham NG7 2RD, United Kingdom
† Department of Crustacea, Museum of Victoria, 285 Russell Street, Melbourne, Victoria 3000 Australia

Abstract

Species of *Serolis* from eastern Australia (except *S. minuta* and related species) are described and figured and a key to distinguish them is presented. These are *Serolis australiensis*, *S. elongata*, *S. levidorsata* sp. nov., *S. longicaudata*, *S. pallida* and *S. tuberculata*.

Introduction

Isopods of the genus *Serolis* Leach, 1818, are common components of the fauna of particulate substrates off the coast of eastern and southern Australia. Eight species have previously been described: *S. tuberculata* Grube, 1875; *S. australiensis* Beddard, 1884; *S. elongata* Beddard, 1884; *S. longicaudata* Beddard, 1884; *S. pallida* Beddard, 1884; *S. minuta* Beddard, 1884; *S. bakeri* Chilton, 1917; and *S. yongei* Hale, 1933.

Little work has been carried out on Australian species and Sheppard's world-wide monograph (1933) and Beddard's (1884b) work remain the standard texts for the identification of these species. Recently, Holdich and Harrison (1980) examined specimens belonging to the *Serolis minuta*-group (a term coined by Monod (1971) to include *S. minuta, S. bakeri* and *S. yongei*) and found a marked capability for infraspecific morphological variation. As an extension of this work, specimens of all other Australian species are examined here and an additional species is described.

The material on which this study is based comes from shelf and bay sediments, largely from south-eastern Australia. All specimens have been identified except for numerous poorly preserved juveniles from Western Port (in Museum of Victoria collections) and two problematical series of specimens. These are discussed under *S. australiensis* and *S. pallida* in turn.

Material for this study has come from the following surveys and institutions:

Port Phillip Bay Environmental Study, 1969-1973 (PPBES) carried out in Port Phillip Bay, Victoria, by the Marine Studies Group, Ministry for Conservation, Melbourne, Victoria;

Crib Point Benthic Survey, 1965-1972 (CPBS) and Westernport Bay Environmental Study, 1973-1974 (WBES), both carried out in Western Port, Victoria, by the Marine Studies Group, Ministry for Conservation, Melbourne.

Bass Strait Survey, 1979-1983 (BSS), carried out by the Museum of Victoria with funding from a Marine Sciences and Technologies Grant;

Shelf Benthic Survey, 1973 (AMSBS) carried out on the New South Wales shelf by the Australian Museum, Sydney, N.S.W.;

Three Bays Survey, 1976, carried out near Townsville, Queensland, by James Cook University, Townsville;

'Endeavour' collections, 1914, made on the New South Wales shelf; and other material from the Museum of Victoria, Melbourne (formerly National Museum of Victoria) (NMV); Australian Museum, Sydney (AM); Universitetets Zoologiske Museum, Copenhagen (ZMC); Tasmanian Museum, Hobart (TM); British Museum (Natural History), London (BMNH); and South Australian Museum, Adelaide (SAM).

Specimens not ascribed to a museum have been placed in a collection in the Department of Zoology, University of Nottingham.

The following developmental stages have been recognized: adult male (male with pereopod 2 prehensile, subchelate); subadult